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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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MCDONNELL BOEHNEN HULBERT & BERGHOFF LLP
300 S. WACKER DRIVE
32ND FLOOR
CHICAGO, IL 60606

EXAMINER	
PETERSEN, CLARK D	

ART UNIT	PAPER NUMBER
1655	

DATE MAILED: 06/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/655,878	SOMBERG ET AL.	
	Examiner	Art Unit	
	Clark D. Petersen	1655	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *1-14* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 September 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-47* is/are pending in the application.

4a) Of the above claim(s) *12 and 27-47* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11,13,14,16 and 19-26* is/are rejected.

7)☒ Claim(s) *15,17 and 18* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 September 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restriction

Applicant's election, with traverse, of Group I, claims 1-26, as well as the election of the species "protein kinase", in the reply filed on April 14, 2006, is acknowledged. The traversal is on the grounds that inclusion of the claims drawn to a kit (claims 27-47) in the examination of the instant application does not constitute an undue burden on the Examiner. Examiner stands by arguments presented in the previous Office Action. A kit of the components detailed in claims 27-47 has as its most basic use the measurement of ATP. A search for methods of detecting transferase activity may not yield a kit of the same components intended for another use; alternatively a search for kit components may not yield the method claims of the instant application. Additionally, the species searched must be restricted because transferases have applications in a luciferin/luciferase/ATP system outside the scope of study of the transferases themselves, i.e., it is an undue burden to search for all applications of transferases in food sterility testing or environmental monitoring as examples.

The restriction requirement and the species election requirement are still deemed proper and are therefore made **FINAL**.

Claims 12 and 27-47 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected Invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on April 14, 2006.

Priority

Applicant's claim for the benefit of a prior-filed application under 35 U.S.C. 119(e) or under 35 U.S.C. 120, 121, or 365(c) is acknowledged. Applicant has not complied with one or more conditions for receiving the benefit of an earlier filing date under 35 U.S.C. 120 as follows:

The later-filed application must be an application for a patent for an invention which is also disclosed in the prior application (the parent or original nonprovisional application or provisional application). The disclosure of the invention in the parent application and in the later-filed application must be sufficient to comply with the requirements of the first paragraph of 35 U.S.C. 112. See *Transco Products, Inc. v. Performance Contracting, Inc.*, 38 F.3d 551, 32 USPQ2d 1077 (Fed. Cir. 1994).

The disclosure of the prior-filed application, Application No. 60/408662, fails to provide adequate support or enablement in the manner provided by the first paragraph of 35 U.S.C. 112 for one or more claims of this application.

Claims 1, 2, and 3, from which all other claims in the instant application depend, make reference to the sequential addition of reaction mixtures. An explicit component of one of the reaction mixtures is a transferase quenching reagent. No mention is made in the Provisional Application 60/408662 of inclusion of a transferase quenching reagent as a necessary step of the Invention disclosed therein. In fact, the specification of Provisional Application 60/408662 cites working examples that include simultaneous

addition of kinase, substrate, and bioluminescent reporter molecules (see, e.g., Example 5, paras. [0050], [0051], [0052]).

Additionally, Provisional Application 60/408662 makes reference only to PKC, PKA, and Lck as specific transferases which can be used in the Invention disclosed therein. Therefore, all other limiting claims drawn to specific protein kinases benefit only from the date on which the instant application was filed.

Specification Objections

The disclosure is objected to because it contains an embedded hyperlink and/or other form of browser-executable code. Applicant is required to delete the embedded hyperlink and/or other form of browser-executable code. See MPEP § 608.01. See for example the hyperlink located p. 15 line 5 of the instant specification.

Claim Objections

Claims 7, 8, and 14 are objected to because of the following informalities: each claim refers to an incorrect claim for antecedent basis, or there is no mention of a term in previous claims to confer antecedent basis.

Claim 7, which depends from claim 5, refers to "the Ser/Thr kinase". Claim 6, but NOT claim 5, mentions a Ser/Thr kinase limitation.

Claim 8, which depends from claim 6, refers to "the dual specificity protein kinase". Claim 7, but NOT claim 6, mentions a dual specificity kinase limitation.

Claim 14, which depends from claim 12, refers to "the detergent". Claim 13, but NOT claim 12, mentions a detergent limitation.

Appropriate correction is required.

Claim 16 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claim 16, which depends from claim 15 in the instant set of claims, is limited in that it states "the cationic detergent is dodecyltrimethylammonium bromide. However claim 15 is limited in that "the detergent comprises dodecyltrimethylammonium bromide, cetyltrimethylammonium bromide, and benzyldimethyldodecylammonium bromide." Therefore claim 16 does not further limit claim 15, but rather changes the limitations in a way not encompassed by claim 15.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 11 and 21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 11 recites the limitation "the growth factor receptors". There is insufficient antecedent basis for this limitation in the claim. There is no mention of of "growth factor receptors" in any other claim in the instant application.

Claim 21 recites the limitation "the transferase inhibitor". There is insufficient antecedent basis for this limitation in the claim. There is no mention of "transferase inhibitor" in any other claim in the instant application.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-8, 19-20, and 22-26 are rejected under 35 U.S.C. 102(e) as being anticipated by Crouch et al (US Pat App # US2004/0253658 A1, effective filing date Dec. 14, 2001). Crouch et al teach a method of detecting kinase activity. This method comprises combining a kinase, ATP and substrate for the kinase and allowing an enzymatic reaction to occur. They teach that the enzymatic reaction solution also comprises a luciferase enzyme and a luciferin, and that by measuring the bioluminescence of the solution, one can determine how much ATP was consumed by the kinase reaction, and therefore the activity of the kinase (see Abstract; see claims 43

and 44, as examples). Crouch et al also teach that the kinase reaction can be allowed to proceed for a certain amount of time before the addition of the luciferase and luciferin (see p. 3 para [0061], for example). They teach that when allowing the kinase reaction to proceed for a period of time before adding luciferase/luciferin, it is advantageous to first stop the kinase reaction with a stopping solution (see p. 4, para [0069], for example).

Crouch et al teach that this method is useful for identifying compounds which can modulate kinase activity (see p. 3, para [0046], for example).

Crouch et al also teach that this method is useful for high-throughput screening of compounds that might influence kinase activity (see p.4-5, para [0085] for example).

Crouch et al also teach working examples of specific kinases for which this method is applicable. For example MAPK can be tested (see p. 6, Example 2, paras. [0106]-[0110], for example) for its ability to phosphorylate its substrate Myelin Basic Protein, and also MEK can be studied for its ability to phosphorylate its substrate MAPK(see p. 7, Example 7, paras. [0115]-[0116], for example).

Crouch et al also teach that the solution for stopping the kinase reaction before addition of the luciferase/luciferin can be EDTA or EGTA, because luciferase is somewhat more resistant to these metal chelators than enzymes generally (see p. 4, paras. [0069] and [0070], for example).

Crouch et al also teach that it is advantageous to use a thermostable luciferase in their method (see p. 4 para [0074], for example).

Crouch et al also teach that, in a method of studying a compound's influence on a kinase's activity, the effect can be either an inhibition or an activation of the kinase (see p. 3, paras [0053]-[0058], for example).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-8 and 19-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crouch et al. The teachings of Crouch et al are discussed above and applied as before.

Crouch et al also do not expressly teach the addition of staurosporine after letting the reaction proceed for a given length of time.

However Crouch et al teach that many compounds can be used as stopping agents, and need not be limited to EGTA, EDTA, or phosphoric acid (see p. 4, para [0072], for example). Additionally, Crouch et al teach that staurosporine is an effective kinase inhibitor that does not seem to affect luciferase activity (see p. 12, Example 14, paras. [0206]-[0212], for example).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to use staurosporine as a stopping agent in a method of studying kinase activity with luciferin/luciferase taught by Crouch et al. One would have

been motivated to do so for the expected benefit that staurosporine, like other mentioned transferase quenching agents, would effectively stop a transferase reaction without inhibiting the subsequent luciferase reaction.

Based upon the teachings of the cited references and the level of skill of one of ordinary skill in the art, there would have been a reasonable expectation of success in practicing the claimed invention.

Claims 1-10, 19-20, and 22-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crouch et al (2001) in view of Briggs et al (Biochem 2000). The teachings of Crouch et al are discussed above and applied as before.

Crouch et al do not expressly teach the use Src family tyrosine kinases or growth factor receptor kinases in their method for assaying kinase activity with luciferase/luciferin. However Crouch et al teach that an advantage of their invention is that it can be applied to the study of any kinase (see p. 1, para [0013], for example).

Briggs et al teach that the Src family of proteins are tyrosine kinases. They expressly mention Src, Lck, Fyn and Lyn as being members of this family, and having tyrosine kinase activity (see Abstract; p. 489; see Introduction, pp. 489-490, as examples).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Src family tyrosine kinases in a method of studying transferase activity with a luciferin/luciferase system taught by Crouch et al, because Crouch et al teach that their system is useful with kinases generally, and Briggs et al

teach that Src family proteins, specifically Src, Lck, Fyn and Lyn, are in fact kinases. One would have been motivated to do so because Briggs et al teach that Src family kinases are important in disease progression; for example they may play a role in AIDS progression (see Abstract, p. 489, for example) in a way that is still not understood.

Based upon the teachings of the cited references and the level of skill of one of ordinary skill in the art, there would have been a reasonable expectation of success in practicing the claimed invention.

Claims 1-8, 11, 19-20, and 22-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crouch et al (2001) in view of Lev et al (EMBO J, 1991). The teachings of Crouch et al are discussed above and applied as before.

Crouch et al do not expressly teach the study of growth factor receptors in a method of studying kinase activity using luciferase/luciferin system. However Crouch et al teach that an advantage of their invention is that it can be applied to the study of any kinase (see p. 1, para [0013], for example).

Lev et al teach that EGFR, PDGFR, and c-KIT are all growth factor receptors, specifically receptor tyrosine kinases, and that all have kinase activity as an essential aspect of their biology (see Abstract, p. 647; see Discussion, pp. 652-3, as examples).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use growth factor receptor family tyrosine kinases in a method of studying transferase activity with a luciferin/luciferase system taught by Crouch et al, because Crouch et al teach that their system is useful with kinases generally, and Lev

et al teach that growth factor receptor family proteins, specifically PDGFR, EGFR and c-KIT are in fact kinases. One would have been motivated to do so because Lev et al teach that growth factor receptor kinases are protooncogenes that stimulate mitogenesis (see Introduction, p. 647, for example), and are therefore of interest in cancer research.

Based upon the teachings of the cited references and the level of skill of one of ordinary skill in the art, there would have been a reasonable expectation of success in practicing the claimed invention.

Claims 1-8, 13-14, 16, 19-20, and 22-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crouch et al. (2001) in view of Simpson et al (J Biolum and Chemilum, 1991). The teachings of Crouch et al are discussed above and applied as before.

Crouch et al do not expressly teach the addition of kinase reaction stopping agents that comprise detergents.

However Hammond et al studied the effects of various types of detergents on the biochemical kinetics of the luciferase/luciferin reaction. They studied anionic, nonionic, and cationic detergent types and measured stability of the luciferase enzyme, rate of reaction, and whether detergents increased or decreased the luminescent signal detected from the reaction (see Materials and Methods; see Table 1, p. 100, as examples).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a secondary solution comprising luciferin, luciferase and a detergent in a method of detecting transferase activity taught by Crouch et al, because Simpson et al teach that it is possible to add a detergent to a solution containing components of a luciferase/luciferin ATP assay system, and detect measurable light signals. One would have been motivated to do so because Simpson et al point out that the possibility exists – and they subsequently demonstrate – that detergents have an ability to stimulate luciferase activity and thus could be used to reduce assay costs or to increase assay sensitivity (see p. 98, col. 1, for example).

Based upon the teachings of the cited references and the level of skill of one of ordinary skill in the art, there would have been a reasonable expectation of success in practicing the claimed invention.

Allowable Subject Matter

Claims 15, 17 and 18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. While art exists describing the use of quaternary ammonium cationic detergents in a method of using luciferin/luciferase to measure ATP concentration, no art exists in which a luciferin/luciferase system comprises all three cationic detergents simultaneously. Art also exists describing the effects of SDS and deoxycholate separately on kinetics of a luciferase assay; however the simultaneous inclusion of both is not published. Lastly,

art also exists describing the use of zwitterionic detergents such as CHAPs or sulfobetaine 3-12 in a method of using luciferin/luciferase to measure ATP concentration, but no art exists in which a luciferin/luciferase system comprises precisely sulfobetaine 3-10. However, claims 15, 17, and 18, while themselves free of the art, are objected to because they depend from claim 14, which is not free of the art.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Clark D. Petersen whose telephone number is (571)272-5358. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terry McKelvey can be reached on (571)272-0775. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Terry a McKelvey

TERRY MCKELVEY, PH.D.
SUPERVISORY PATENT EXAMINER